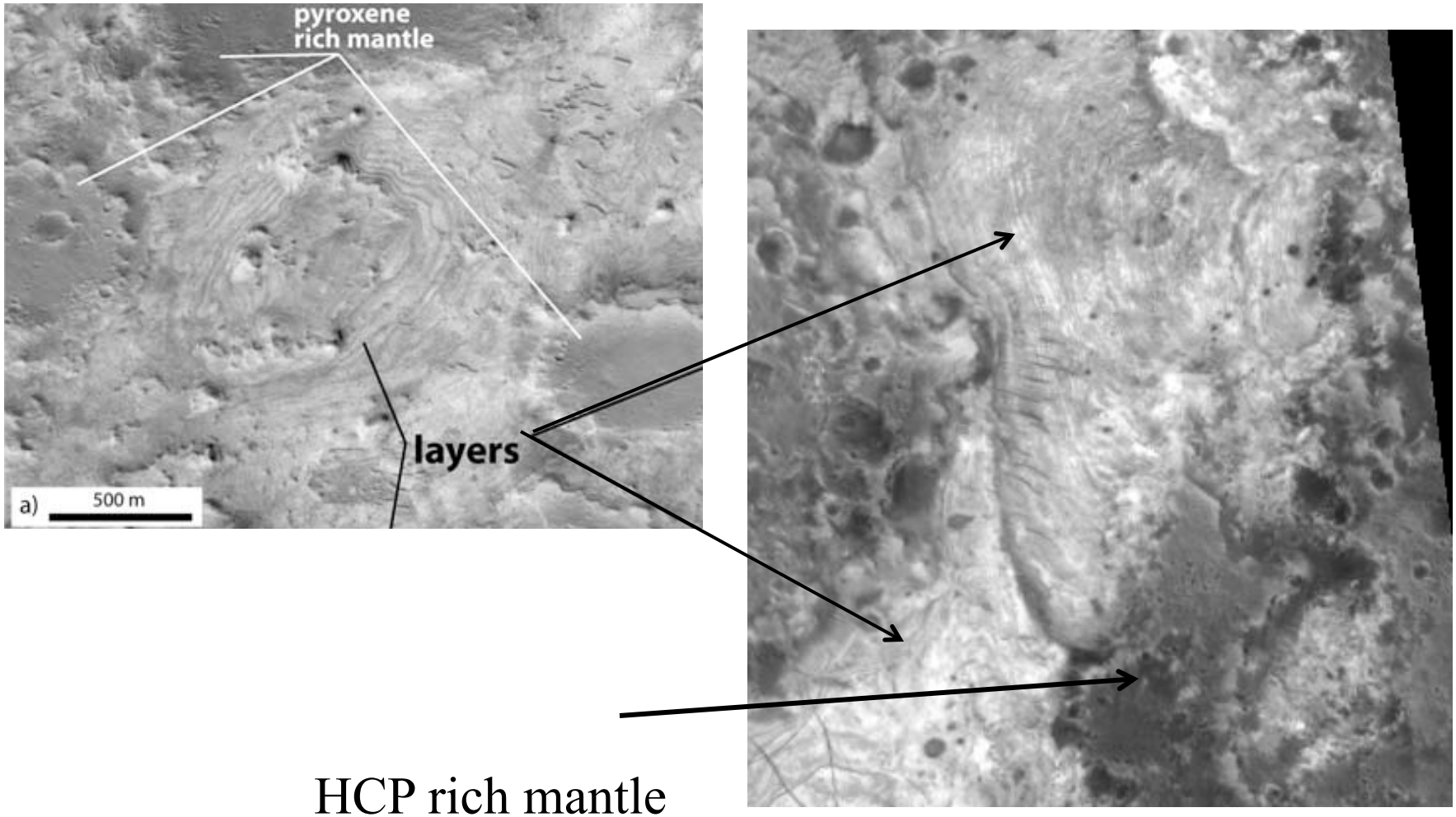
Context

Regional stratigraphy:

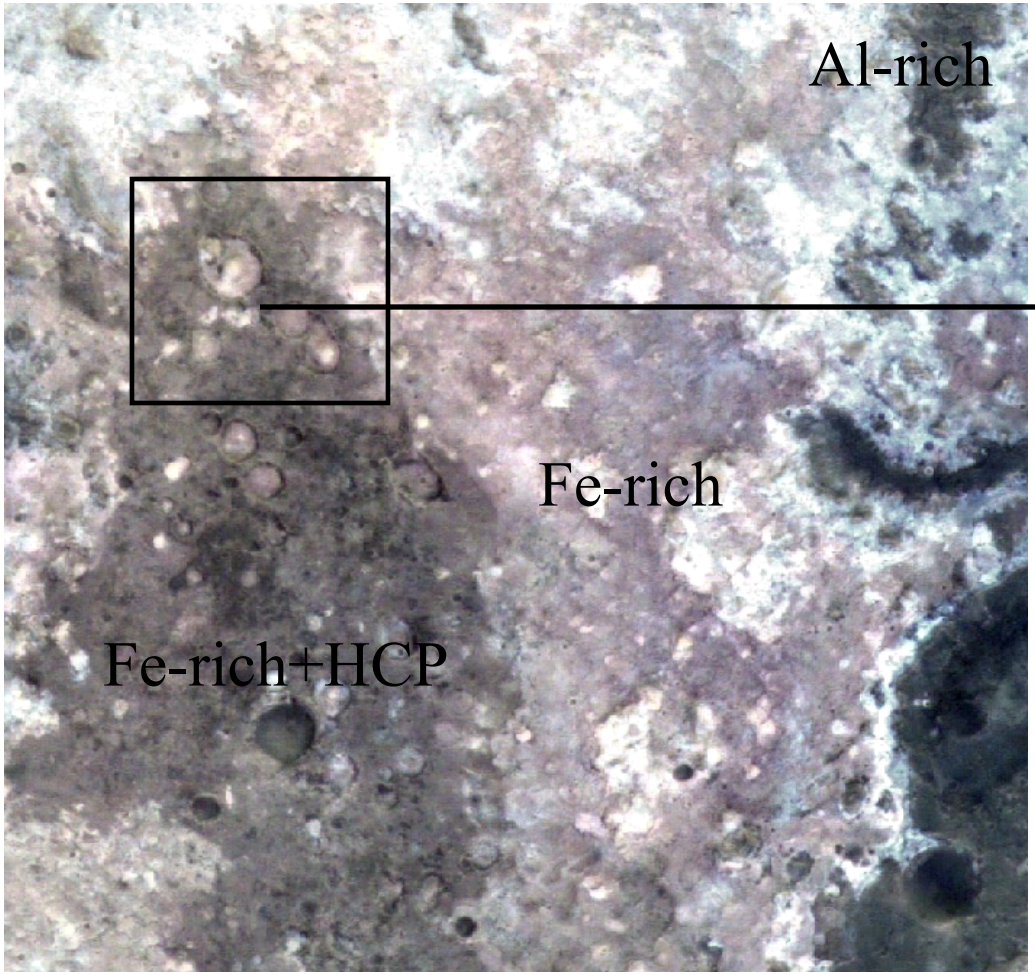
1. First contact: Top-lying mantling

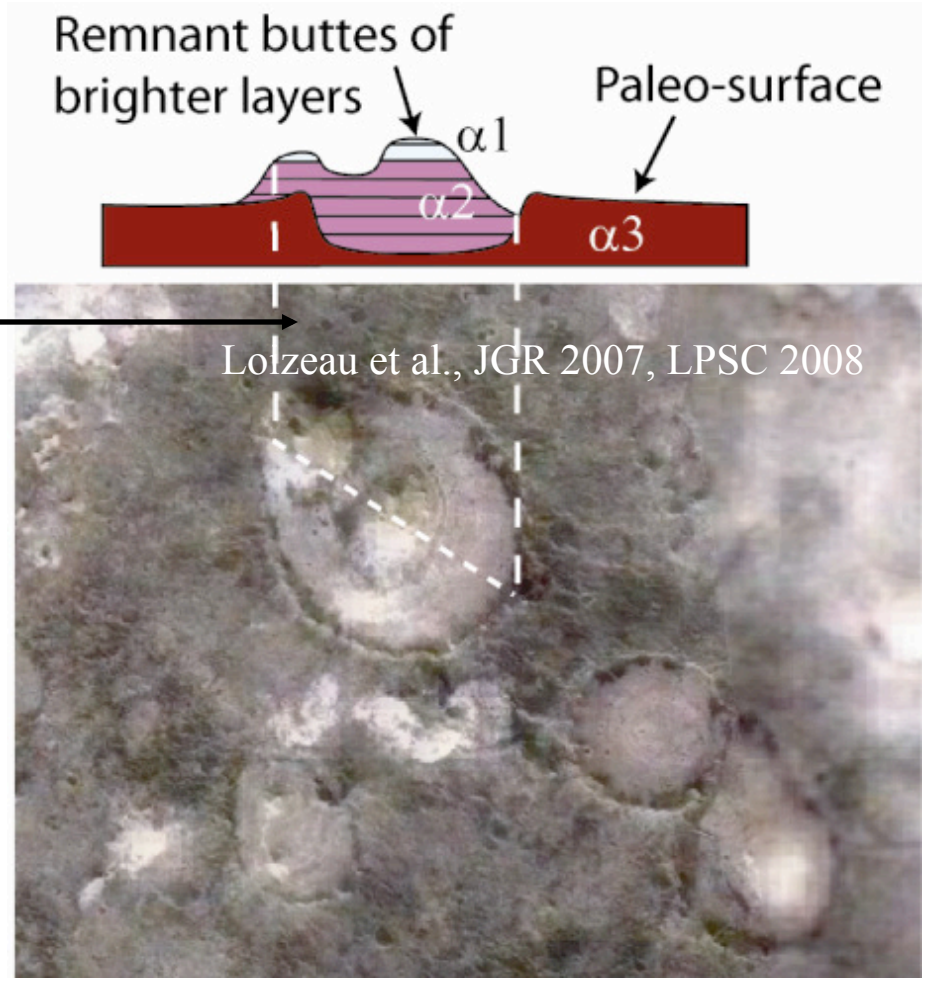


HCP rich mantle

Regional stratigraphy:

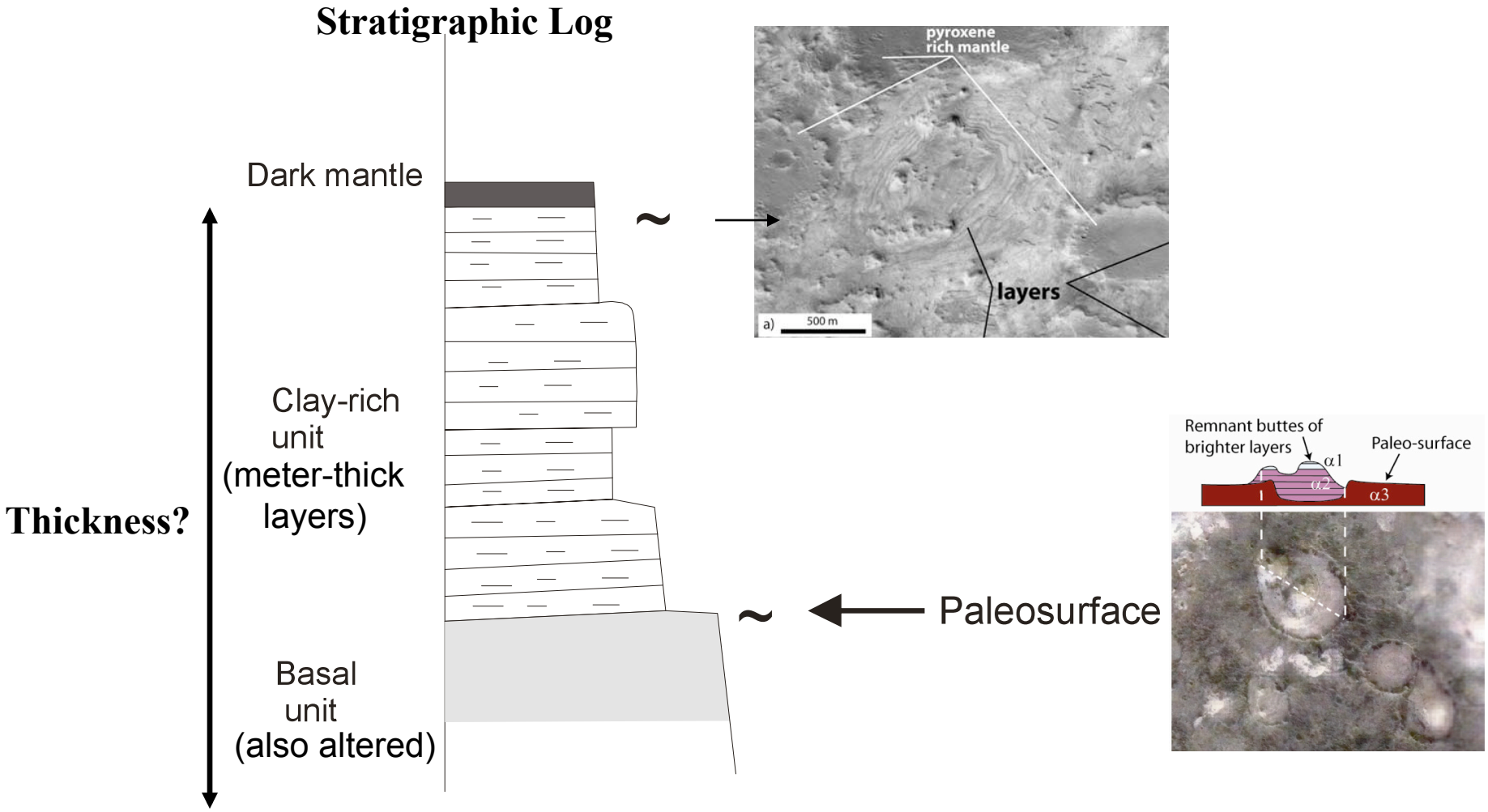
2. Basal contact





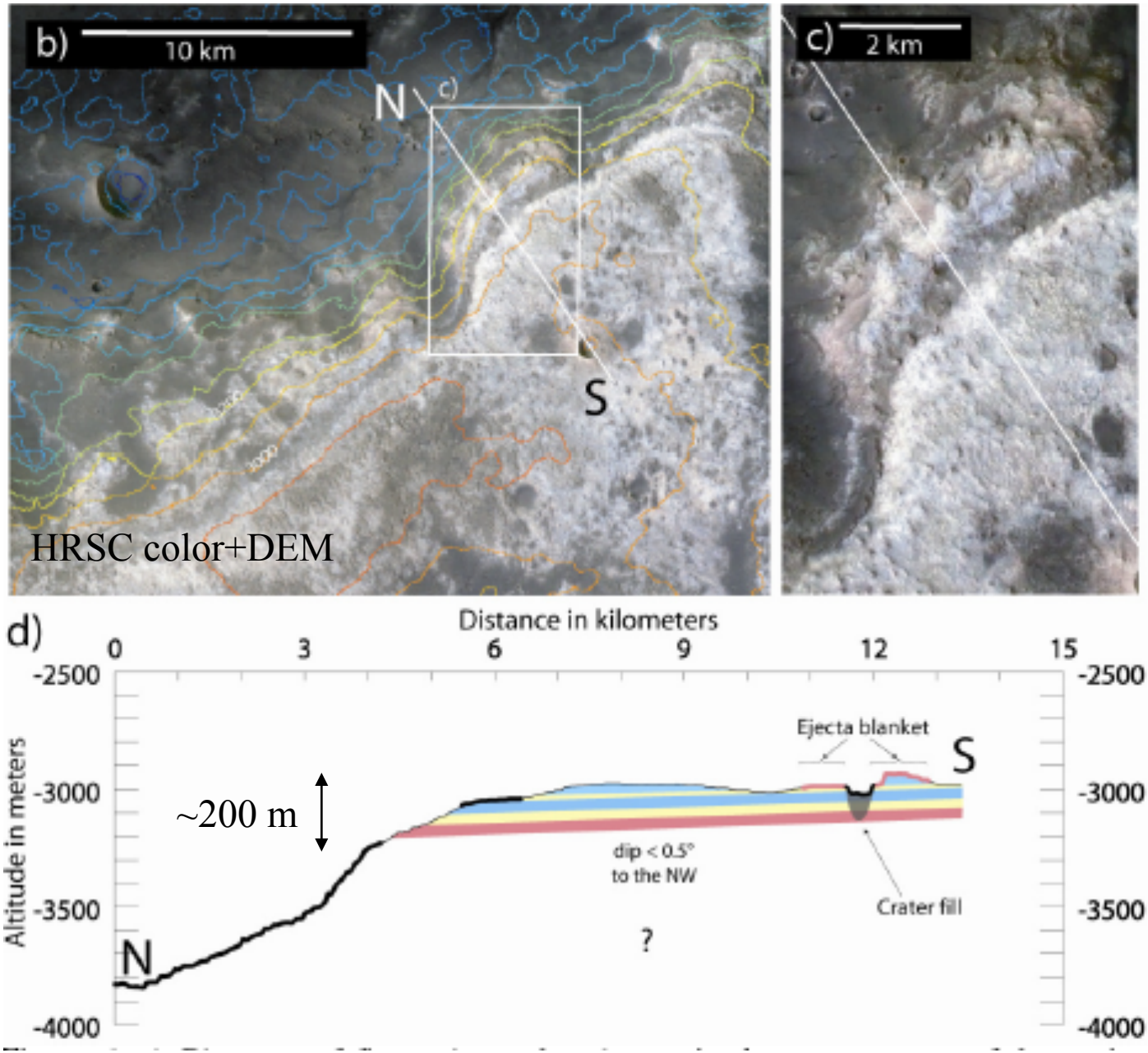
Regional stratigraphy:

Two unconformities
(or hiatus for the lower one)



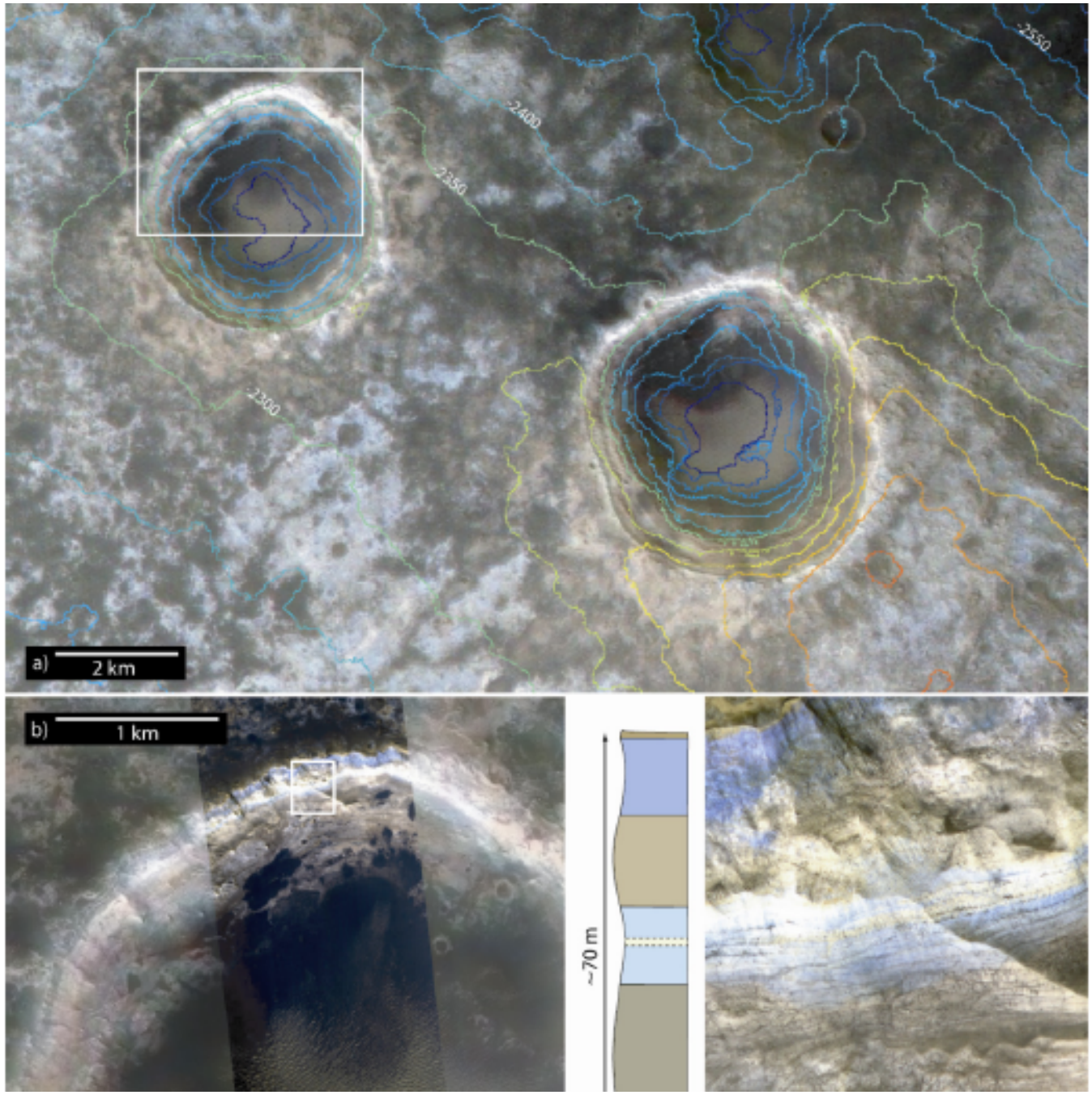
Thickness?

Local scarps 200 m high: Minimum thickness



Thickness?

Minimum 150 m from a series of impact craters



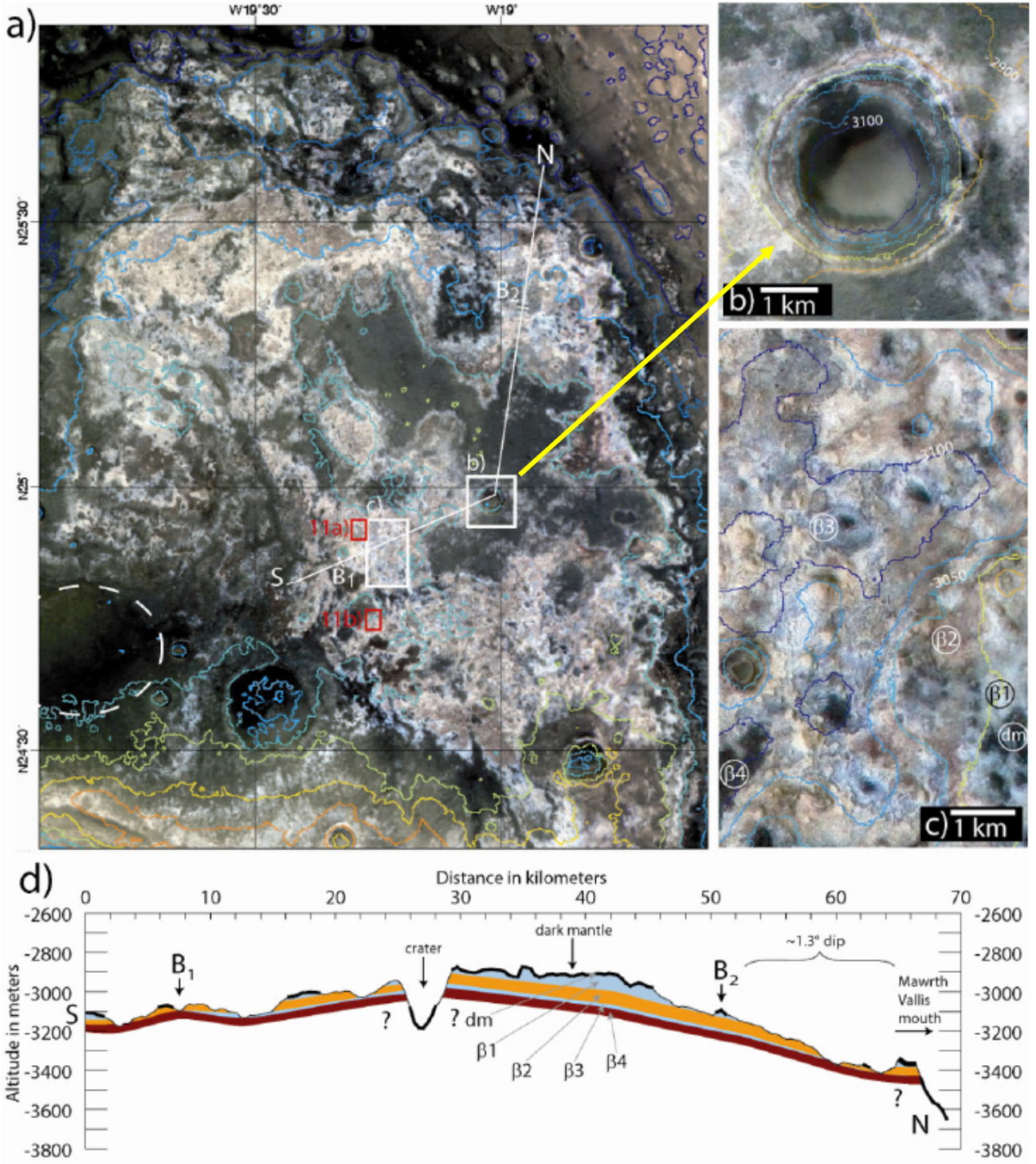
Internal layering

* Minimum 4 sub-units of different colors: 50-100 m each

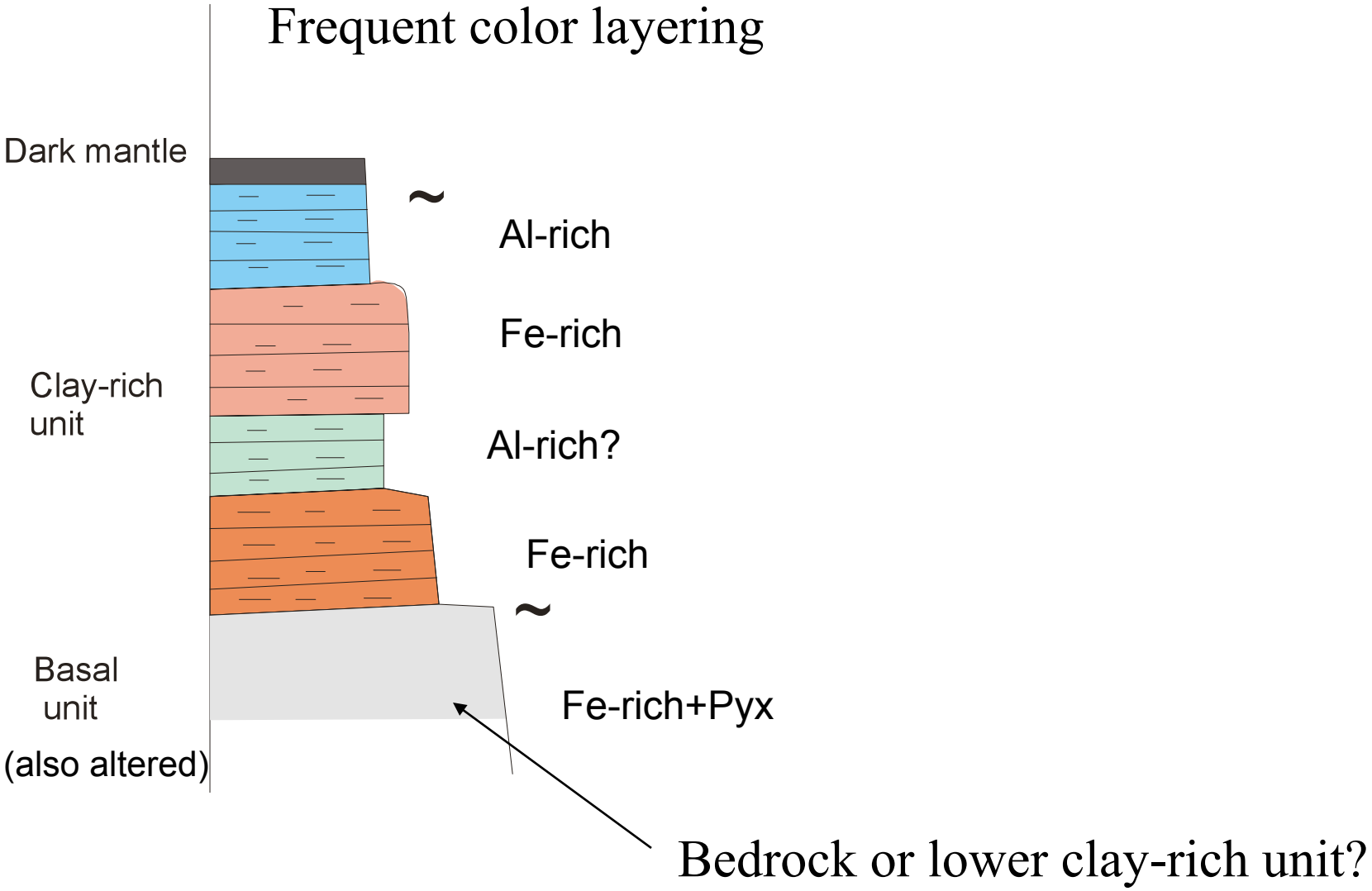
=200 m total thickness

Geometry:

• Deposition over pre--existing topography

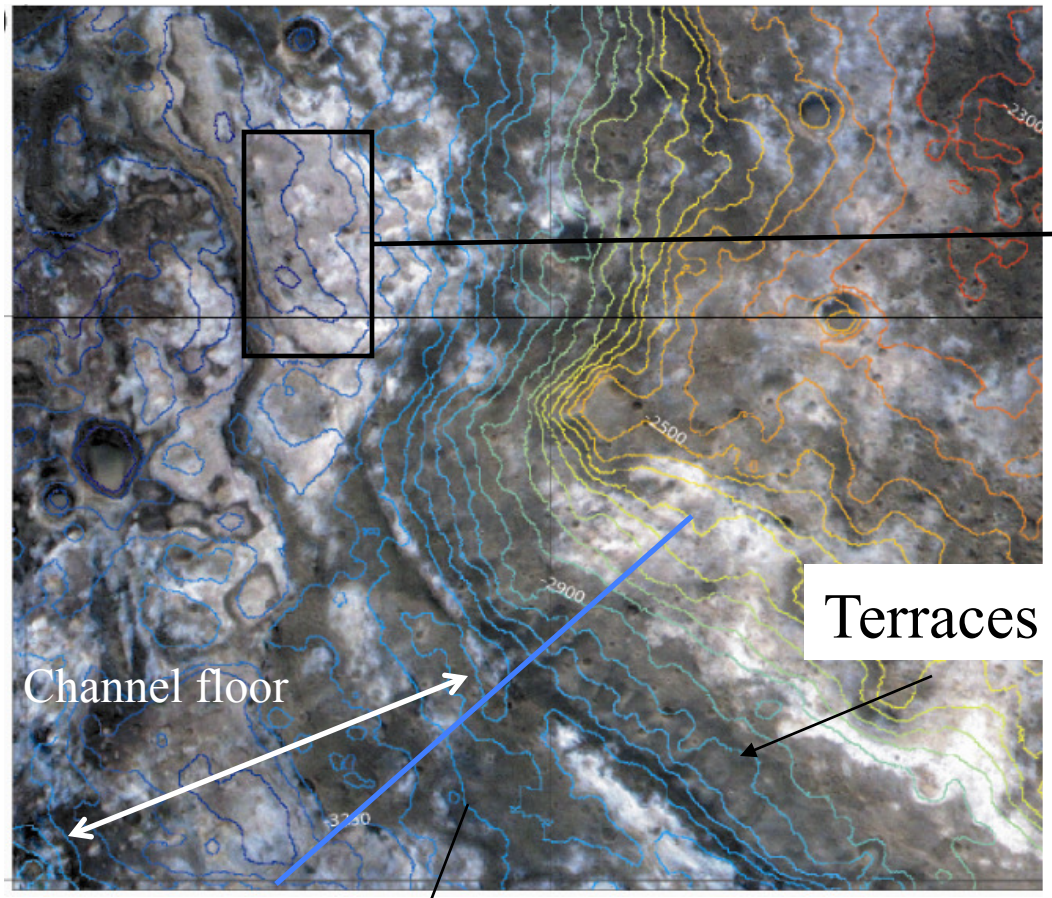


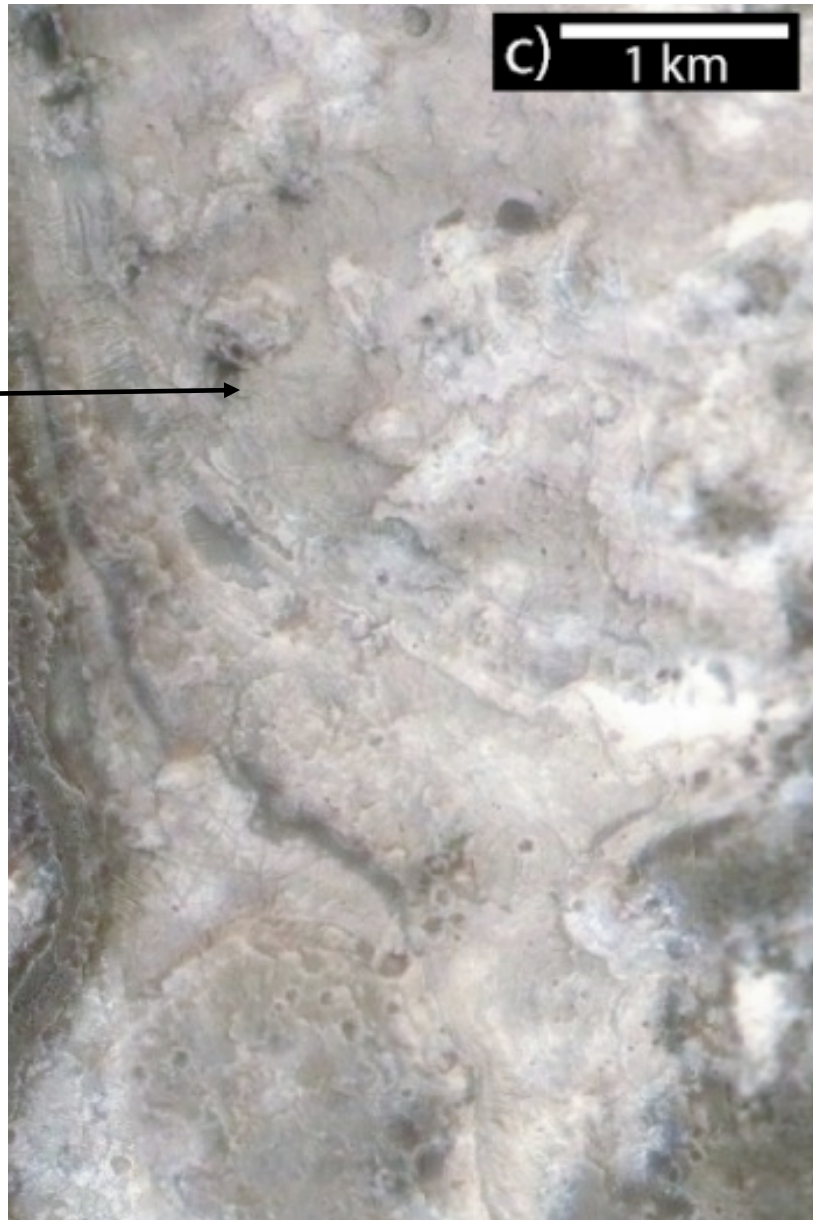
Variations of the internal stratigraphy



Chronology relative to Mawrth Vallis

1. Outcrops in terraces

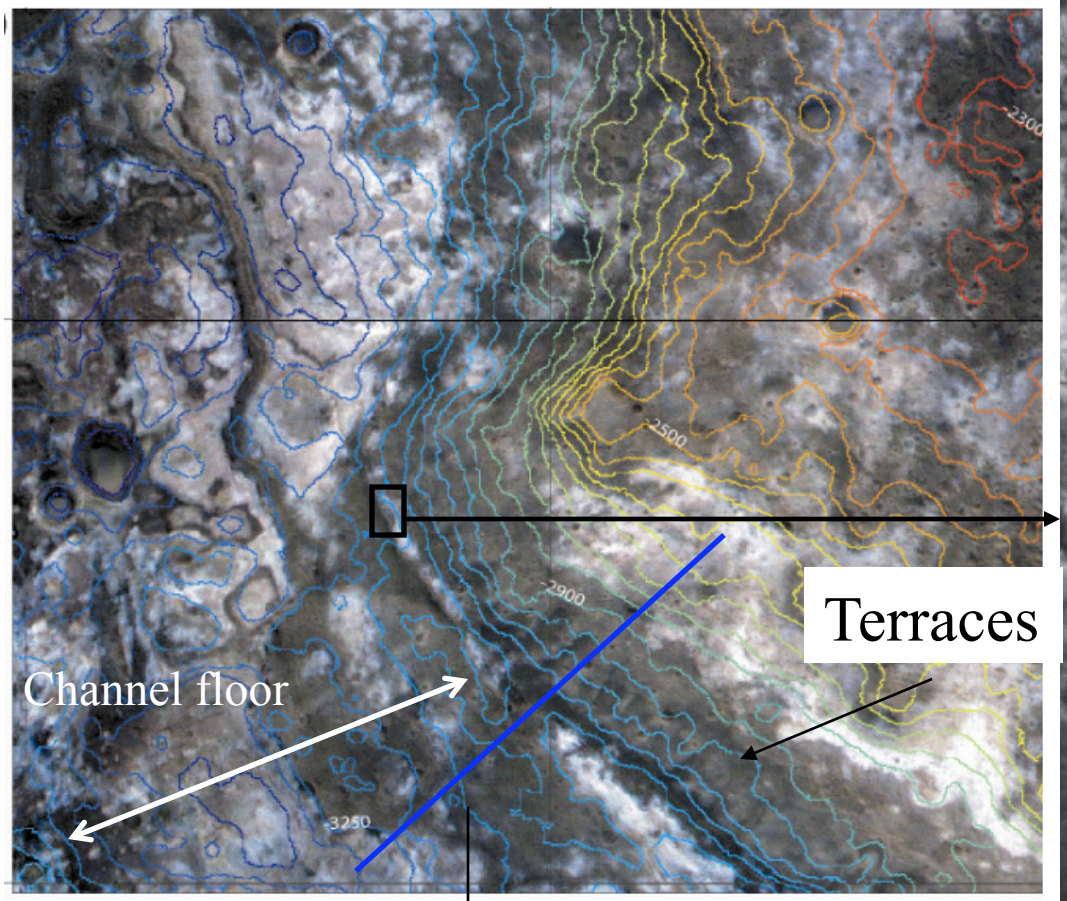


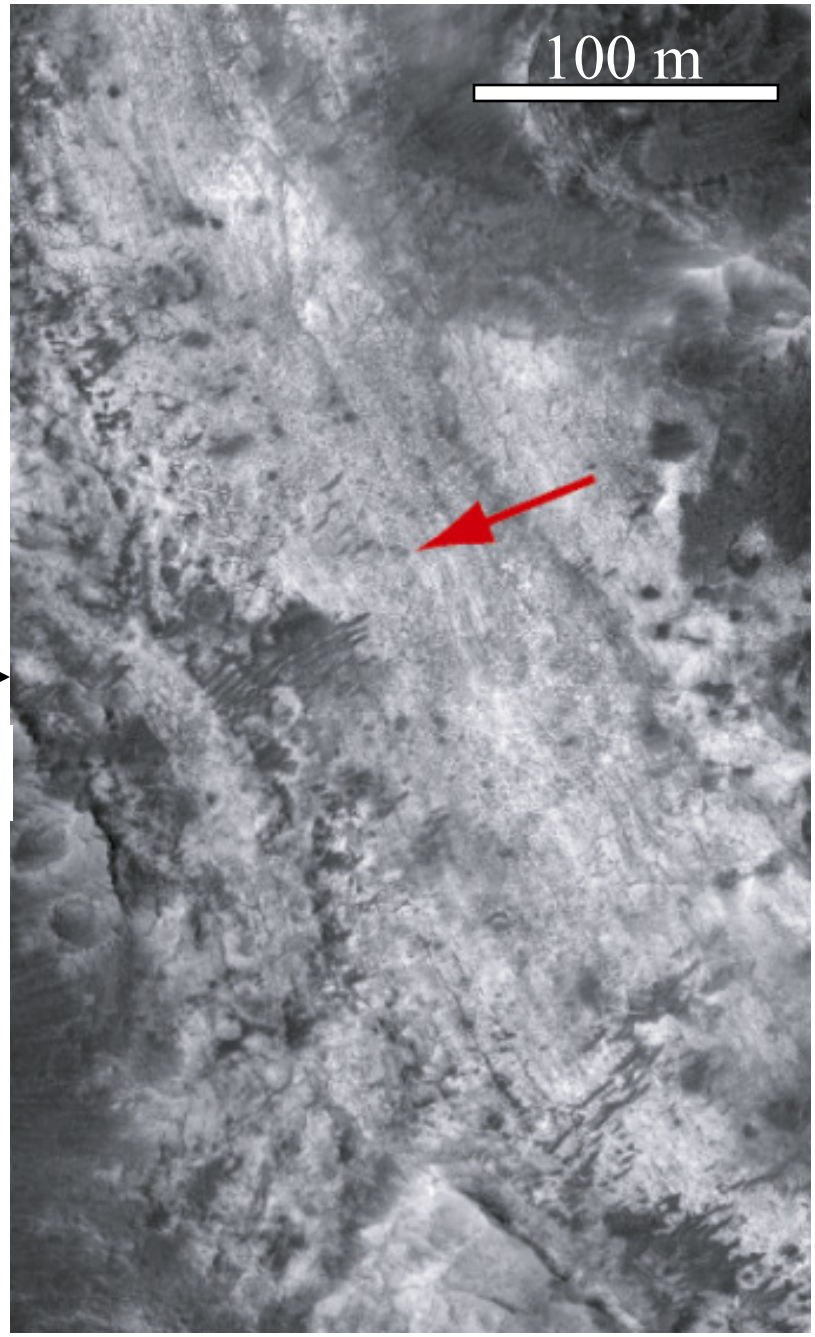


Fe-rich layered unit

Chronology relative to Mawrth Vallis

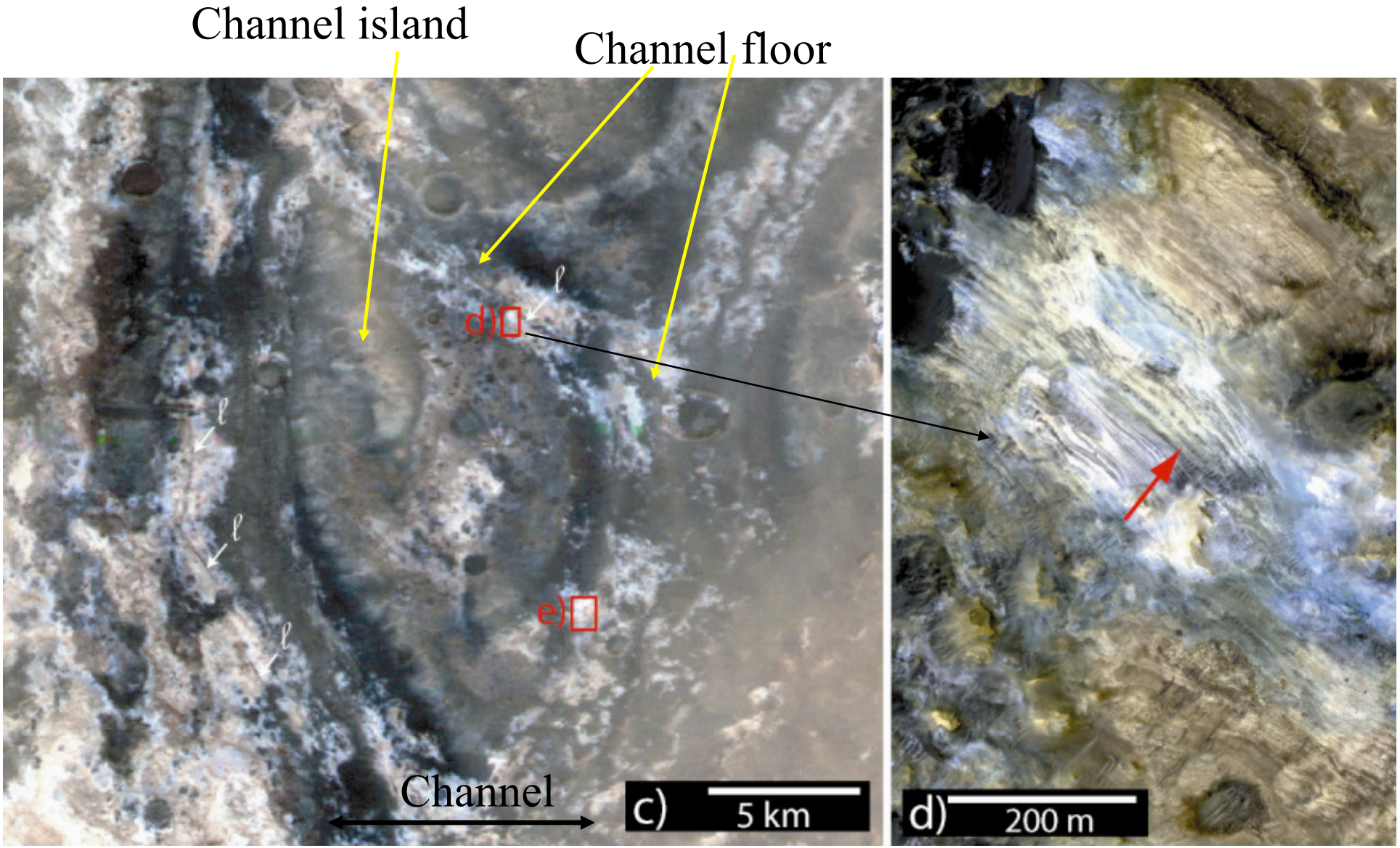
1. Outcrops in terraces

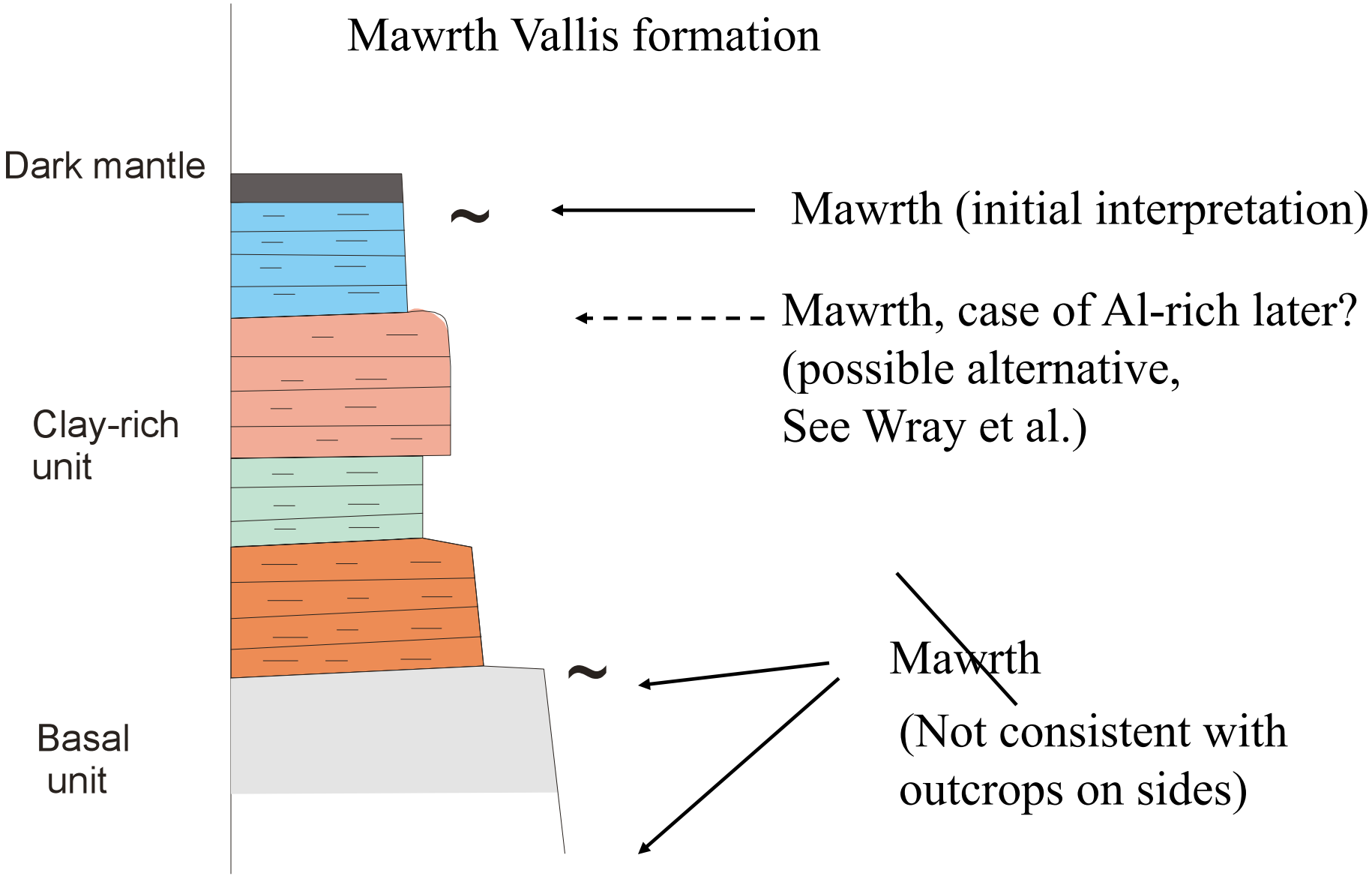




Chronology relative to Mawrth Vallis:

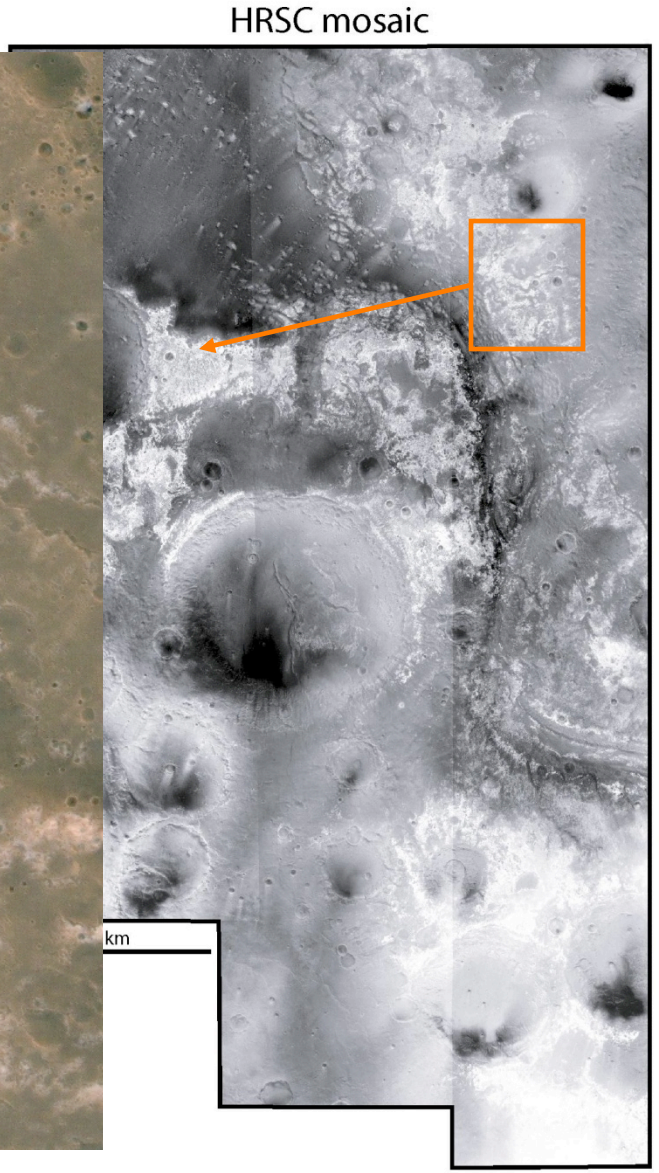
2. Outcrops and grooves on channel floor




Mawrth Vallis formation
Dark mantle
Clay-rich unit
Basal unit
Mawrth (initial interpretation)
Mawrth, case of Al-rich later?
(possible alternative,
See Wray et al.)
Mawrth
(Not consistent with
outcrops on sides)

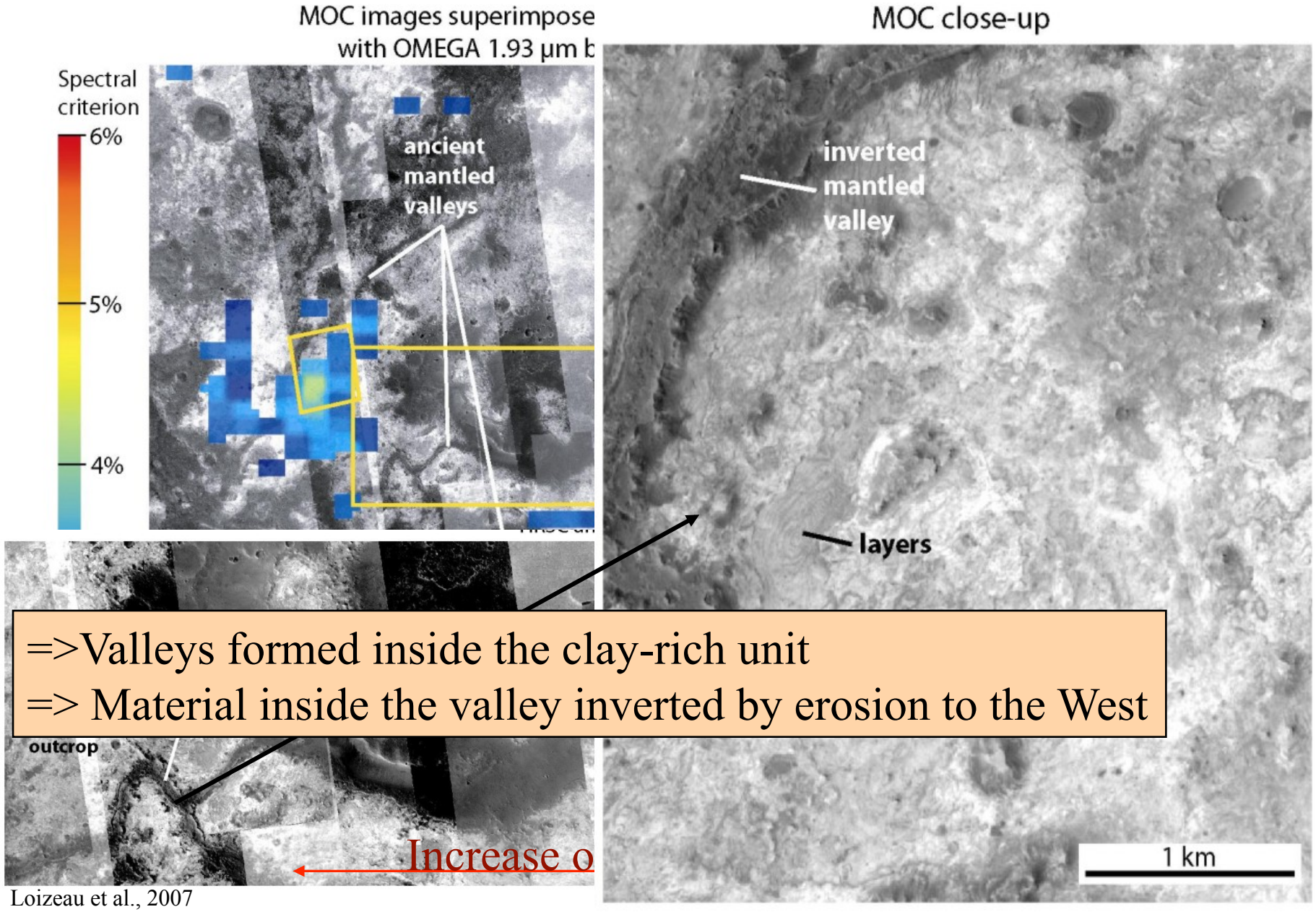
Chronology relative to valley networks

1. Inverted valleys



Chronology relative to valley networks

1. Inverted valleys



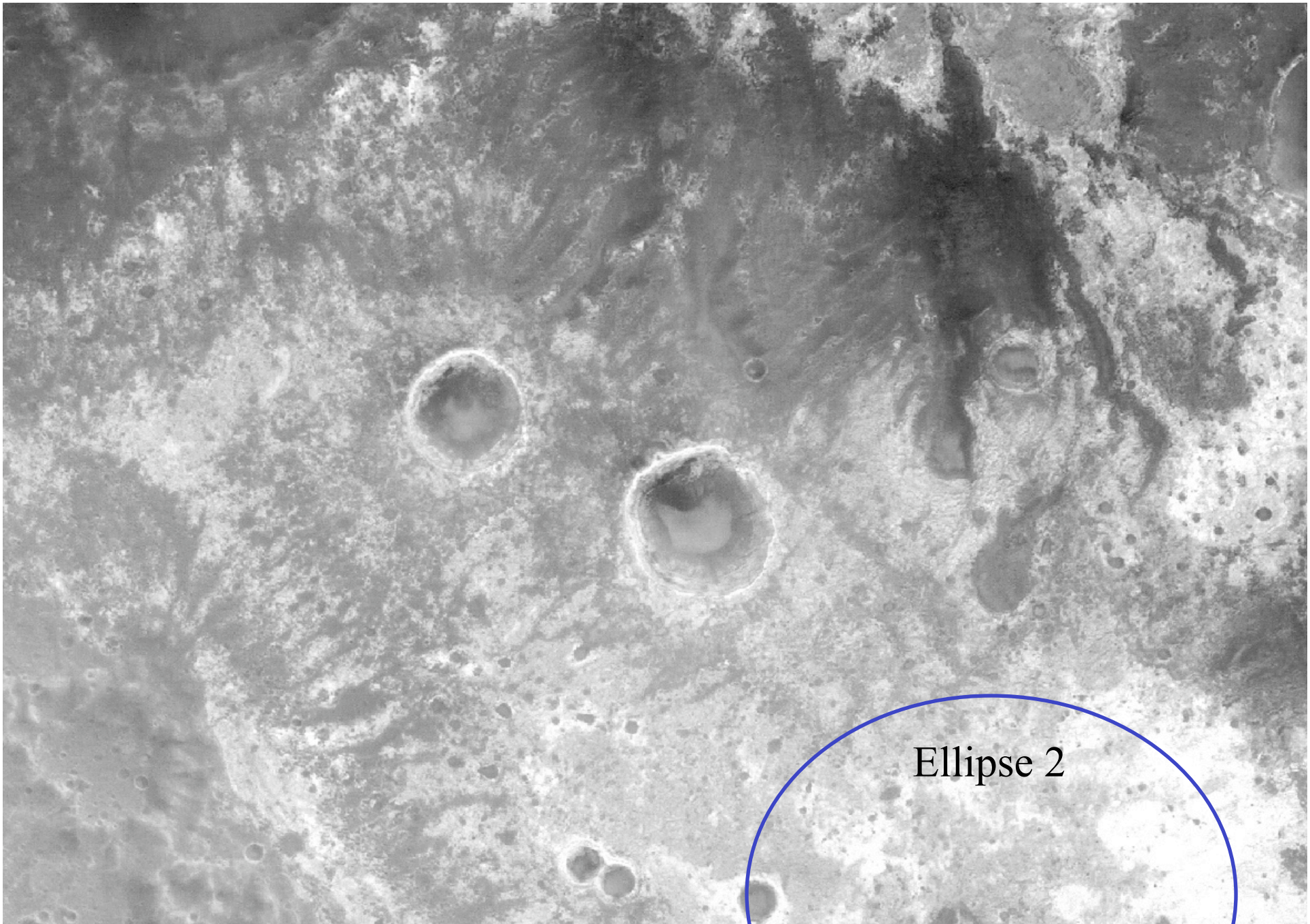
=>Valleys formed inside the clay-rich unit

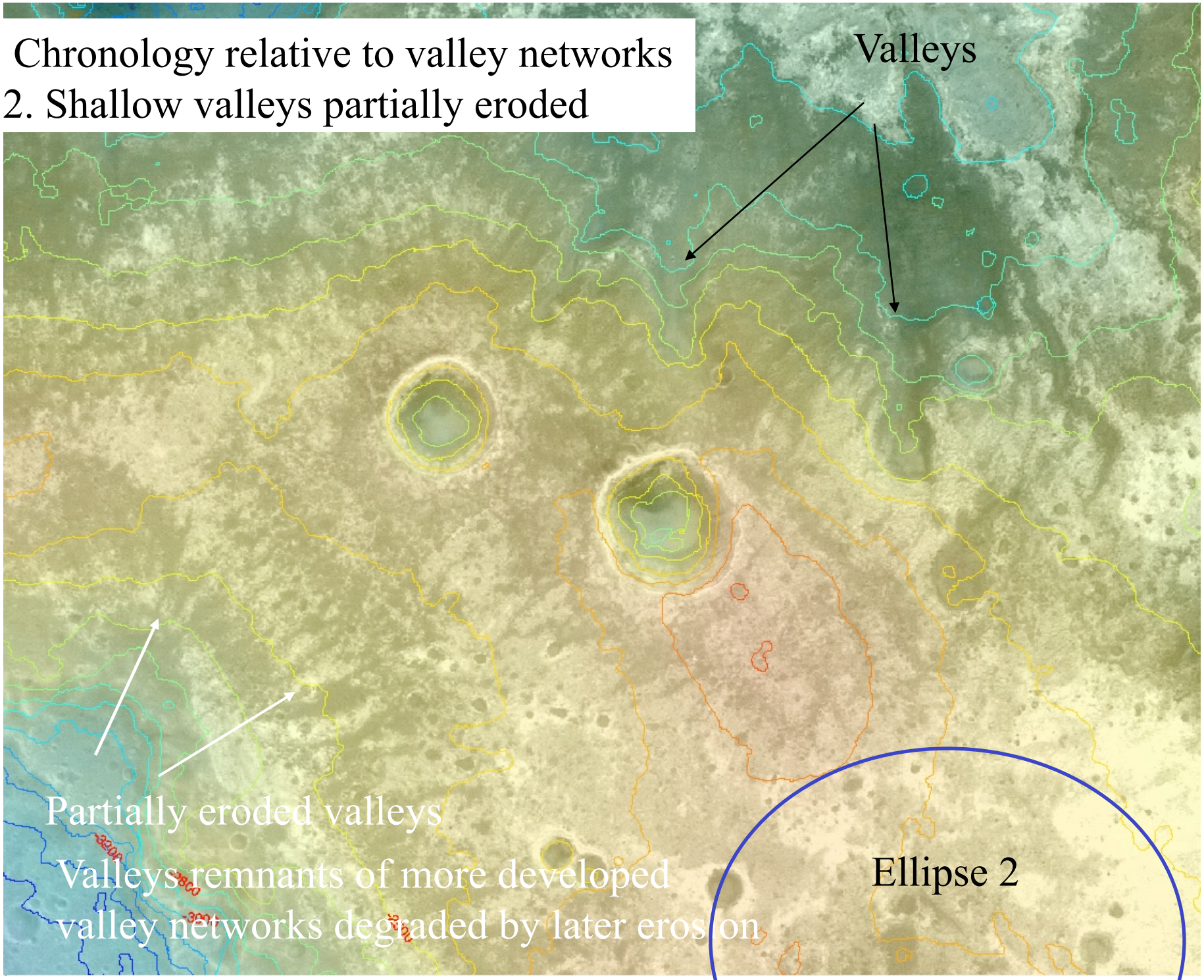
=> Material inside the valley inverted by erosion to the West

Loizeau et al., 2007

Chronology relative to valley networks

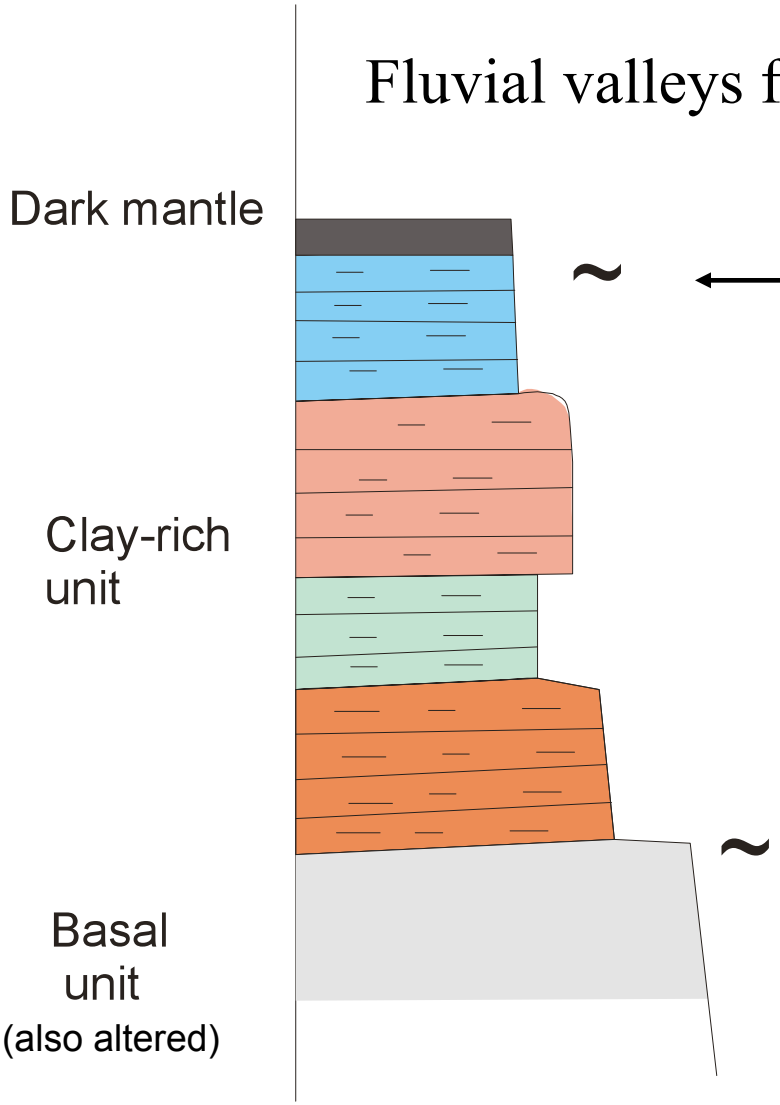
2. Shallow valleys partially eroded




Chronology relative to valley networks
2. Shallow valleys partially eroded
Valleys
Partially eroded valleys
Valleys remnants of more developed valley networks degraded by later erosion
Ellipse 2

Habitability?

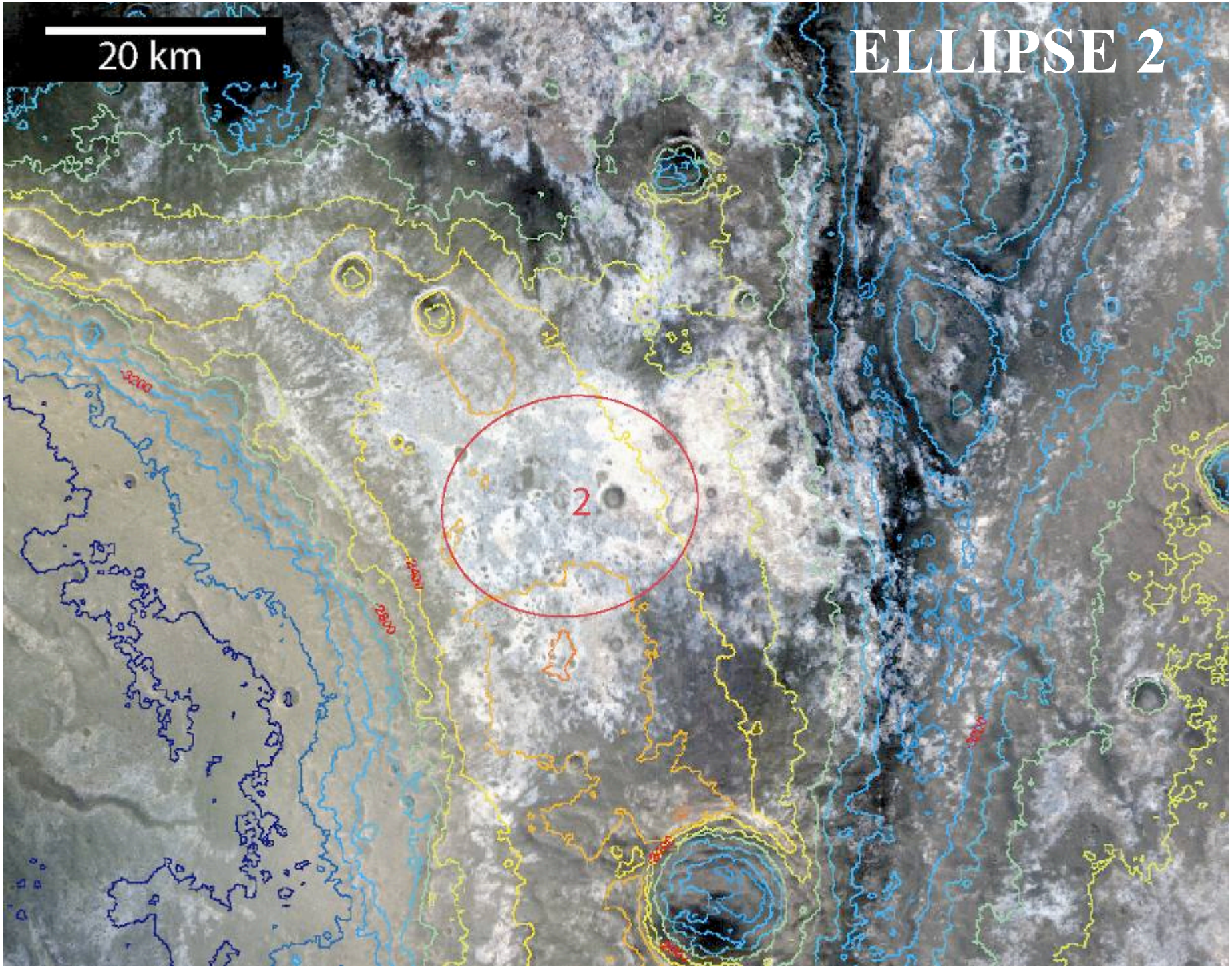
Fluvial valleys formation

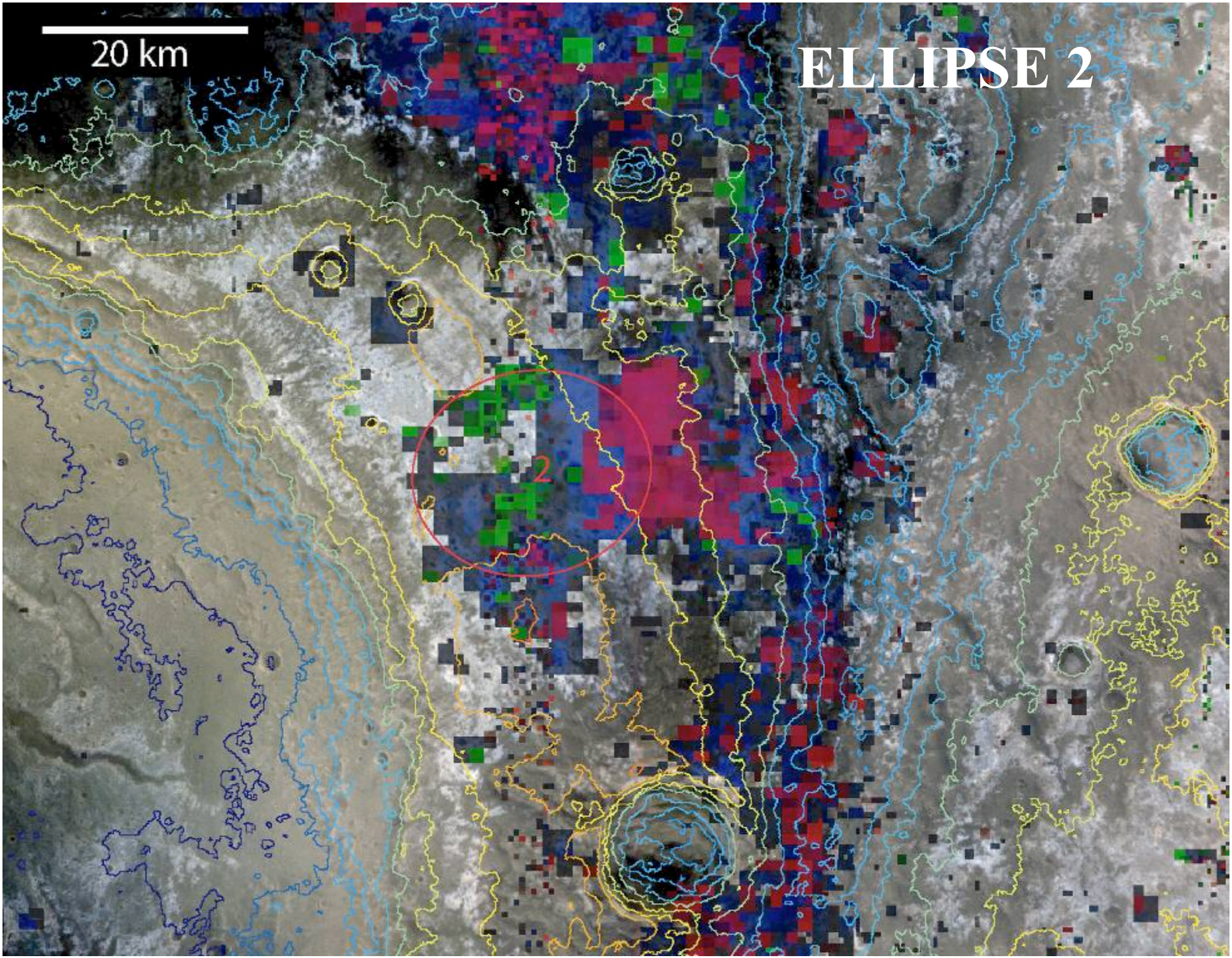


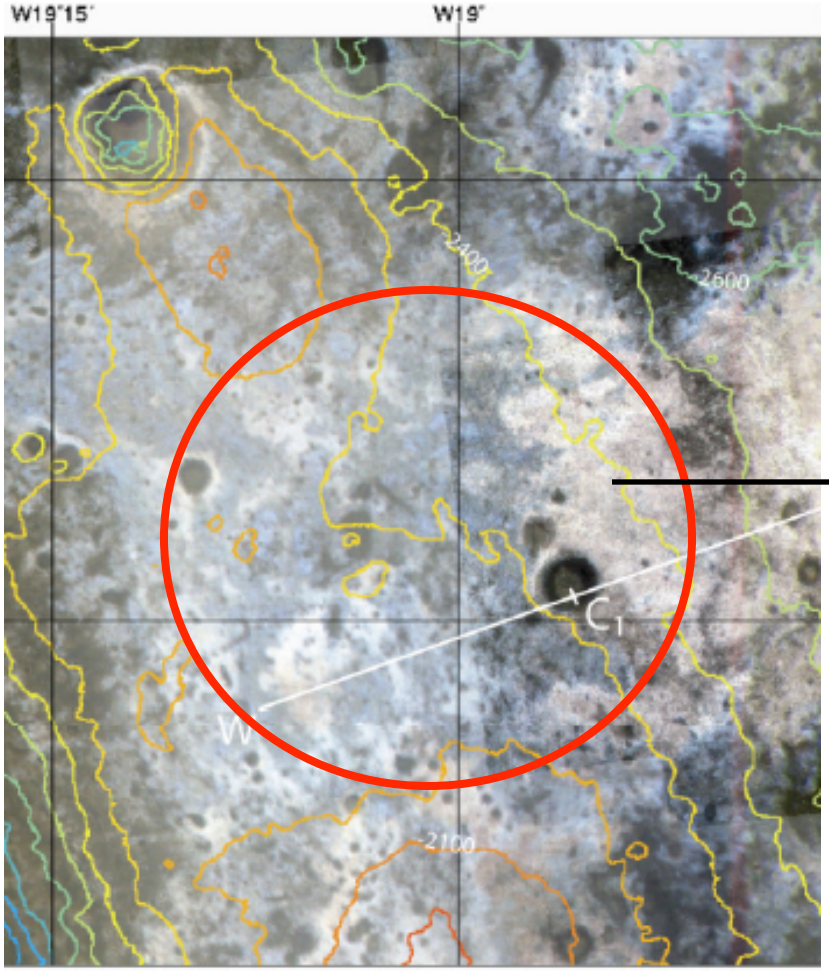
Valleys inside clay-unit

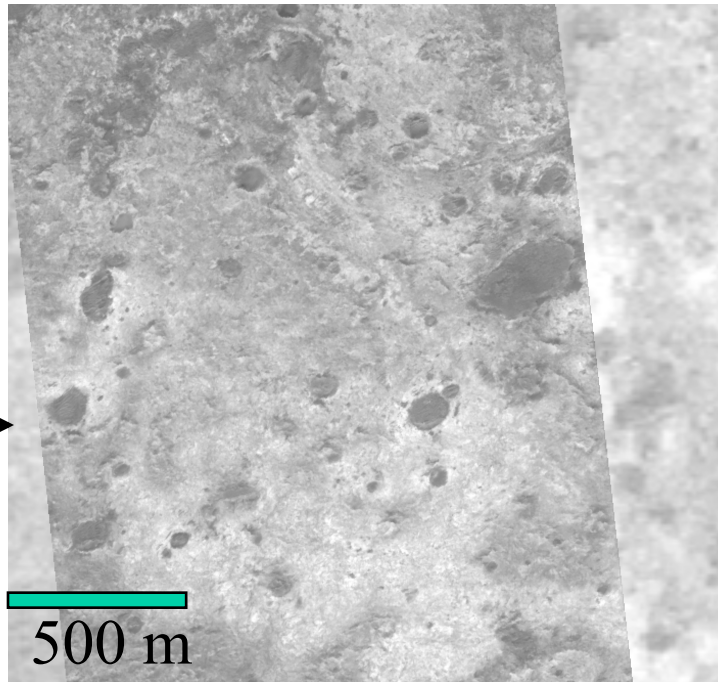
Valleys during clays formation?
⇒ But no interbedded channels found yet

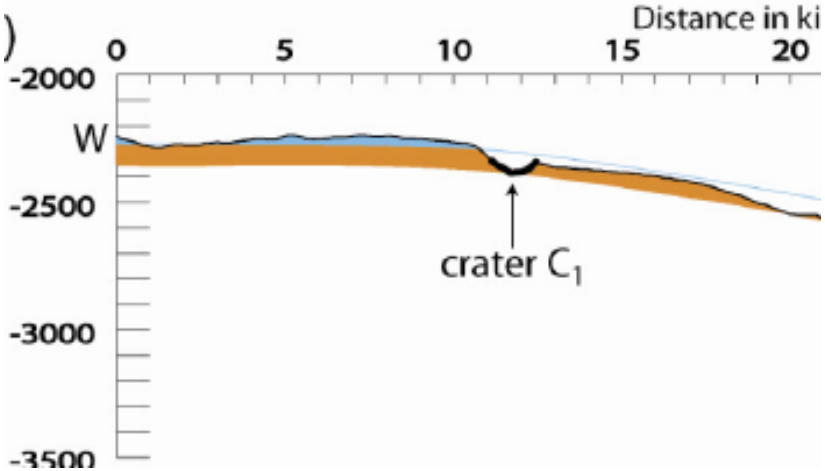
Clay-rich unit deposited before the LN/EH fluvial erosion peak
+ Role of valleys in the alteration to be addressed

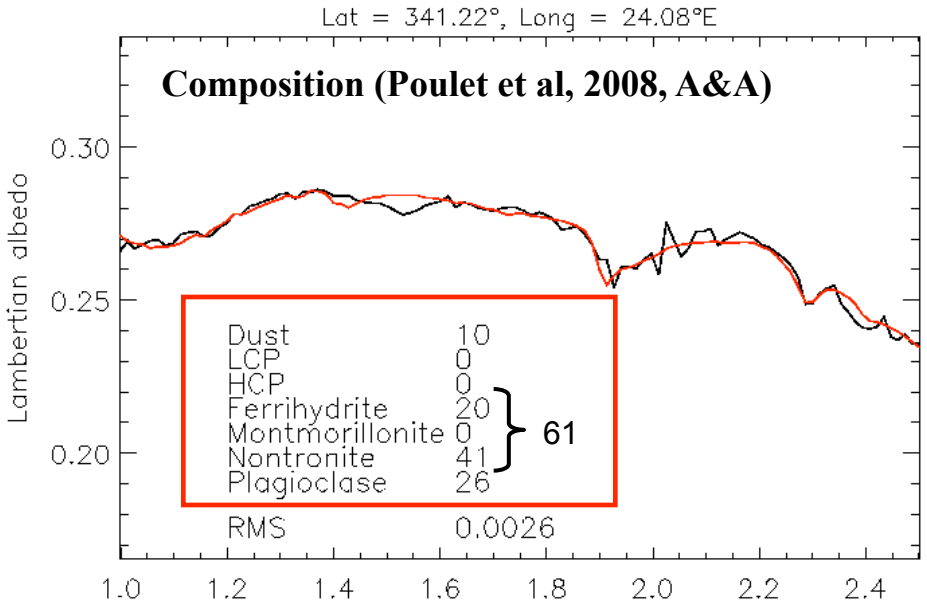

20 km
ELLIPSE 2
2

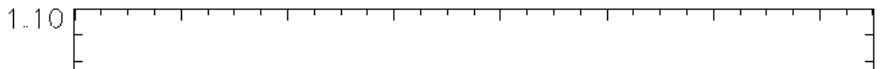

20 km
ELLIPSE 2
2


W19°15'
W19°
2400
2600
2100
C1
W


500 m


Distance in ki
0
5
10
15
20
-2000
-2500
-3000
-3500
W
crater C1


Lat = 341.22°, Long = 24.08°E
Composition (Poulet et al, 2008, A&A)
Lambertian albedo
0.30
0.25
0.20
Dust 10
LCP 0
HCP 0
Ferrihydrite 20
Montmorillonite 0
Nontronite 41
Plagioclase 26
61
RMS 0.0026
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4


1.10